COMBINED CRACKING AND SELECTIVE HYDROGEN COMBUSTION FOR CATALYTIC CRACKING

ABSTRACT

A catalyst system and process for combined cracking and selective hydrogen combustion of hydrocarbons are disclosed. The catalyst system contains at least one solid acid component and at least one metal-based component which consists of (a) oxygen and/or sulfur and (b) a metal combination selected from the group consisting of:

i) at least one metal from Group 3 and at least one metal from Groups 4-15 of the Periodic Table of the Elements;

ii) at least one metal from Groups 5-15 of the Periodic Table of the Elements, and at least one metal from at least one of Groups 1, 2, and 4 of the Periodic Table of the Elements;

iii) at least one metal from Groups 1 and 2, at least one metal from Group 3, and at least one metal from Groups 4-15 of the Periodic Table of the Elements; and

iv) two or more metals from Groups 4-15 of the Periodic Table of the Elements,

wherein the at least one of oxygen and sulfur is chemically bound both within and between the metals and, optionally, (3) at least one of at least one support, at least one filler and at least one binder. The process is such that the yield of hydrogen is less than the yield of hydrogen when contacting the hydrocarbons with the solid acid component alone. Further the emissions of NO_x from the regeneration cycle of the catalyst system are reduced.